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Amendment and Response

Applicant: John Wade et al.

Serial No.: 10/788,808

Filed: February 27, 2004

Docket No.: 200208190-1

Title: WIDE ARRAY FLUID EJECTION DEVICE

REMARKS

The following Remarks are made in response to the Non-Final Office Action mailed October 13, 2006, in which claims 1-3, 5, 7-19, 22-27, and 30-31 were rejected.

With this Amendment, claims 7 and 22 have been cancelled without prejudice, and claims 1, 2, 8-10, 12, 13, 15, 17, 18, and 27 have been amended to clarify Applicant's invention.

Claims 1-3, 5, 8-19, 23-27, 30, and 31, therefore, remain pending in the application and are presented for reconsideration and allowance.

Claim Rejections under 35 U.S.C. § 103

Claims 1, 5, 7, 10-12, 15-18, 22, 24-26, 27, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saunders et al. US Patent No. 5,541,629 in view of *In re Harza*, 274 F.2d 669, 671, 124 USPQ 378, 380 (CCPA 1960).

Claims 1-3, 10-14, 18, 19, 27, 30, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson US Patent No. 6,471,320 in view of *In re Harza*, 274 F.2d 669, 671, 124 USPQ 378, 380 (CCPA 1960).

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saunders et al. US Patent No. 5,541,629 in view of *In re Harza*, 274 F.2d 669, 671, 124 USPQ 378, 380 (CCPA 1960) and further in view of Norton US Patent No. 6,309,040.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saunders et al. US Patent No. 5,541,629 in view of *In re Harza*, 274 F.2d 669, 671, 124 USPQ 378, 380 (CCPA 1960), and further in view of Anderson US Patent No. 6,471,320.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saunders et al. US Patent No. 5,541,629 in view of Norton US Patent No. 6,309,040, and further in view of Anderson US Patent No. 6,471,320.

With this Amendment, claims 7 and 22 have been cancelled without prejudice. The rejections of these claims, therefore, are rendered moot.

With this Amendment, independent claim 1 has been amended to clarify that the fluid ejection device includes, amongst other things, "a first shift register including a first set of N memory elements serially receiving a series of fire enable values," "a second shift register including a second set of N memory elements serially receiving N image data

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sub-blocks of an image data block," and "a third shift register including a third set of N memory elements receiving in parallel the N image data sub-blocks from the second set of N memory elements of the second shift register and holding the N image data sub-blocks."

With this Amendment, independent claim 18 has been amended to clarify that the fluid ejection device includes, amongst other things, "a fire enable shift register including a series of N memory elements configured to serially receive and serially transfer a series of fire enable values through the series of N memory elements," "a data input shift register including a first set of N memory elements configured to serially receive N image data bits of a row of image data," and "a data hold shift register including a second set of N memory elements configured to receive in parallel the N image data bits from the first set of N memory elements and hold the N image data bits."

With this Amendment, independent claim 27 has been amended to clarify that the method of enabling N fluid ejecting elements of a fluid ejection device includes, amongst other things, "serially receiving image data values in each of N memory elements of a data input shift register," "parallel shifting the image data values from the N memory elements of the data input shift register to the N memory elements of the data hold shift register and holding the image data values in the N memory elements of the data hold shift register," and "serially receiving fire enable values in each of N memory elements of a fire enable shift register."

With respect to the Saunders et al., Anderson, and Norton patents, Applicant submits that these patents, individually or in combination, do not teach or suggest a fluid ejection device as claimed in independent claim 1, do not teach or suggest a fluid ejection device as claimed in independent claim 18, and do not teach or suggest a method as claimed in independent claim 27.

For example, regarding the Saunders et al. patent, the Saunders et al. patent discloses printhead driver circuitry including an address generator 34 which receives the print command and in response generates address signals for drivers 31 of array 32, and a print enable data register 40 which receives the print command and in response generates one or more print enable signals for drivers 31 of array 32 (col. 4, lines 36-49; col. 5, lines 5-9; Fig.

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3). As such, an address signal (Ax) from address generator 34 and a print enable signal (PEy) from print enable data register 40 is input to each driver 31 (col. 5, lines 26-38; Fig. 4A).

The Saunders et al. patent, however, does not include a first shift register including a first set of N memory elements serially receiving a series of fire enable values, a second shift register including a second set of N memory elements serially receiving N image data sub-blocks of an image data block, and a third shift register including a third set of N memory elements receiving in parallel the N image data sub-blocks from the second set of N memory elements of the second shift register and holding the N image data sub-blocks, does not include a fire enable shift register including a series of N memory elements configured to serially receive and serially transfer a series of fire enable values through the series of N memory elements, a data input shift register including a first set of N memory elements configured to serially receive N image data bits of a row of image data, and a data hold shift register including a second set of N memory elements configured to receive in parallel the N image data bits from the first set of N memory elements and hold the N image data bits, and does not include serially receiving image data values in each of N memory elements of a data input shift register, parallel shifting the image data values from the N memory elements of the data input shift register to the N memory elements of the data hold shift register and holding the image data values in the N memory elements of the data hold shift register, and serially receiving fire enable values in each of N memory elements of a fire enable shift register, as claimed in independent claims 1, 18, and 27, respectively.

Regarding the Anderson patent, the Anderson patent discloses a printhead including a first nozzle column register 102 and logic units 100 configured to receive first serial nozzle data and provide first nozzle firing control signals for controlling the firing of ink drops from a first column of nozzles, and a second nozzle column register 202 and logic units 200 configured to receive the first serial nozzle data and provide second nozzle firing control signals for controlling the firing of ink drops from a second column of nozzles, wherein first column redundancy logic is configured to disable selected nozzles of the first column of nozzles from firing, and second column redundancy logic is configured to disable selected nozzles of the second column of nozzles from firing (see, e.g., Abstract; Fig. 3).

The Anderson patent, however, does not include a first shift register including a first set of N memory elements serially receiving a series of fire enable values, a second shift

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Serial No.: 10/788,808

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register including a second set of N memory elements serially receiving N image data sub-blocks of an image data block, and a third shift register including a third set of N memory elements receiving in parallel the N image data sub-blocks from the second set of N memory elements of the second shift register and holding the N image data sub-blocks, does not include a fire enable shift register including a series of N memory elements configured to serially receive and serially transfer a series of fire enable values through the series of N memory elements, a data input shift register including a first set of N memory elements configured to serially receive N image data bits of a row of image data, and a data hold shift register including a second set of N memory elements configured to receive in parallel the N image data bits from the first set of N memory elements and hold the N image data bits, and does not include serially receiving image data values in each of N memory elements of a data input shift register, parallel shifting the image data values from the N memory elements of the data input shift register to the N memory elements of the data hold shift register and holding the image data values in the N memory elements of the data hold shift register, and serially receiving fire enable values in each of N memory elements of a fire enable shift register, as claimed in independent claims 1, 18, and 27, respectively.

Regarding the Examiner's contention that it would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to duplicate the set of memory elements of the Saunders et al. and Anderson patents, Applicant submits that the second set of N memory elements and the third set of N memory elements of independent claim 1, the first set of N memory elements and the second set of N memory elements of independent claim 18, and the N memory elements of the data input shift register and the N memory elements of the data hold shift register of independent claim 27 are not merely "duplicate parts" for a "multiple effect" as implied by the Examiner.

For example, the second set of N memory elements of independent claim 1 are "serially receiving N image data sub-blocks of an image data block" whereas the third set of N memory elements of independent claim 1 are "receiving in parallel the N image data sub-blocks from the second set of N memory elements of the second shift register and holding the N image data sub-blocks." The second set of N memory elements of independent claim 1 and the third set of N memory elements of independent claim 1, therefore, are receiving the N image data sub-blocks in different manners (serially vs. in parallel), and are acting on the N

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image data sub-blocks in different manners (receiving vs. receiving and holding). As such, Applicant submits that the second set of N memory elements of independent claim 1 and the third set of N memory elements of independent claim 1 are not merely duplicate parts for a multiple effect. Accordingly, Applicant submits that it would not have been obvious to one of ordinary skill in the art at the time of Applicant's invention to duplicate the set of memory elements of the Saunders et al. and Anderson patents as suggested by the Examiner.

In view of the above, Applicant submits that independent claims 1, 18, and 27 are each patentably distinct from the Saunders et al., Anderson, and Norton patents and, therefore, are each in a condition for allowance. Furthermore, as dependent claims 2, 3, 5, 8-17 further define patentably distinct claim 1, dependent claims 19 and 23-26 further define patentably distinct claim 18, and dependent claims 30 and 31 further define patentably distinct claim 27, Applicant submits that these dependent claims are also in a condition for allowance. Applicant, therefore, respectfully requests that the rejections of claims 1-3, 5, 7-19, 22-27, 30, and 31 under 35 U.S.C. 103(a) be reconsidered and withdrawn, and that claims 1-3, 5, 8-19, 23-27, 30, and 31 be allowed.

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In view of the above, Applicant respectfully submits that pending claims 1-3, 5, 8-19, 23-27, 30, and 31 are all in a condition for allowance and requests reconsideration of the application and allowance of all pending claims.

Any inquiry regarding this Amendment and Response should be directed to either Donald J. Coulman at Telephone No. 541-715-1694, Facsimile No. 541-715-8581 or Scott A. Lund at Telephone No. (612) 573-2006, Facsimile No. (612) 573-2005. In addition, all correspondence should continue to be directed to the following address:

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Respectfully submitted,

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CERTIFICATE UNDER 37 C.F.R. 1.8: The undersigned hereby certifies that this paper or papers, as described herein, are being facsimile transmitted to the United States Patent and Trademark Office, Fax No. (571) 273-8300 on this 16TH day of January, 2007.

By: 
Name: Scott A. Lund